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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/578,510

05/08/2006

Nobuyuki Suda

127956

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25944 7590 05/27/2009

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ALEXANDRIA, VA 22320-4850

EXAMINER

DEFRAK, JOSEPH S

ART UNIT

PAPER NUMBER

3724

MAIL DATE

DELIVERY MODE

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/578,510	<b>Applicant(s)</b> SUDA, NOBUYUKI	
	<b>Examiner</b> JOSEPH DEFRANK	<b>Art Unit</b> 3724	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 15 May 2009.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-4 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-4 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                     | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

### **DETAILED ACTION**

1. This action is in response to the amendment received on 5/15/09. Claims 1-4 are pending.

#### ***Claim Rejections - 35 USC § 103***

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

3. Claims 1-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over prior (related) art figure 7 in the current application (as previously cited; hereafter APA) in view of Wisner (US 3,747,447; as previously cited).

4. With respect to claim 1, APA discloses a piercing device (90) comprising: a first shaft (94) having a first axis; a second shaft (95) having a second axis, the second axis being eccentrically arranged relative to the first axis (by distance  $\delta$ ); an outer tube (91) rotatably supported on the first shaft so that the outer tube can be driven for rotation; a plurality of piercing needles (93) rotatably supported on the second shaft, said plurality of piercing needles arranged in a circumferential direction, said plurality of piercing needles being spaced from each other in a circumferential direction projecting radially outwards, the piercing needles each being extendable and retractable relative to an outer surface of the outer tube via holes (96) formed in the outer tube. APA does not disclose the needles being mounted on needle support members (they are mounted directly to the inner tube 92). Further, because the needles are mounted directly to the inner tube, APA does not disclose the needles being independently rotatably supported on the second shaft and each movable toward and away from other piercing needles in

the circumferential direction.

The art of Wisner discloses a piercing device comprising a plurality of piercing needles (60) mounted on needle support members (55) wherein the needles are independently rotatable about the axis of rotation because the needle support members are mounted on the cylinder (18) with a pivot joint (57). The needle support members are further confined by restraining members (90, 91) which prevent over rotation of the needles by providing a torque to the piercing needles. The art of Wisner uses piercing needles which are mounted on a rotatable wheel and are independently rotatably with respect to the axis of rotation in order to allow the pins to enter and leave the workpiece in a vertical fashion to create "accurate reproductions of the shape of the perforating elements" (column 2 lines 15-18). Examiner notes that this is a solution to prevent "slashed trenches" (column 1 line 39) which are created when a piercing pin is used on a rotating piercing assembly but because of the extension, the pierced hole becomes elongated (column 1 lines 25-60). These "slashed trenches" are elongated holes as shown in figure 5; the current art of Wisner allows for normal circular holes (figure 6) to be created. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the piercing device of APA to have the needles mounted on a support member which is independently rotatable with respect to the second axis, but still confined by needle restraining members, and therefor are independently rotatable and each movable toward and away from other piercing needles in the circumferential direction in view of the art of Wisner in order to create circular holes instead of stretched holes.

5. With respect to claim 2, APA discloses the piercing device wherein said outer tube and said needle support members are connected to a driving means for driving them at a constant speed. The needle support members are mounted on an inner tube (92) and the inner tube and outer tube complete the same number of rotations per minute. Examiner notes that if the two sets didn't complete the same number of rotations per minute, the needles would crash into the side wall or inner wall of the outer tube.

6. With respect to claims 3 and 4, APA discloses the piercing device wherein a rotating radius of the outer surface of the outer tube (91) and a rotating radius of a tip end of the plurality of piercing needles are the same with respect to each other (see positions C and A where the radii are the same; also note that at position B and 180 degrees from B the distance that 93 is protruding past the surface is the same distance as 93 is withdrawn at the opposite position) but does not explicitly disclose that the amount of eccentricity of the first and second shafts is within a range of 10-15 mm. However, examiner notes that this dimension is dependent on the scale of the piercing device. If the piercing device is large and the dimensions are kept to scale, the amount of eccentricity will be proportionately large. If the piercing device is small and the dimensions are kept to scale, the amount of eccentricity will also be proportionately small. It would have been obvious to one having ordinary skill in the art at the time the invention was made to scale the device of APA up or down to have an eccentricity of 10-15 mm, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ

215 (CCPA 1980). In this case, the eccentricity is dependent on what is intended to be pierced. Obviously, the more eccentric the shafts are, the further the piercing elements will protrude. For a thicker material, a higher eccentricity is needed to fully pierce.

### ***Response to Arguments***

7. Applicant's arguments filed with respect to claim 1 have been fully considered but they are not persuasive.

8. Applicant argues that "the perforating segments 55 of Wisner are not 'independently rotatably supported on the second shaft'" because the art of Wisner essentially does not show the second shaft. The art of Wisner has a main rotating shaft and then a plurality of spaced needles which each have their own rotating axis. Examiner notes that the second shaft of the current invention is the shaft which provides the eccentricity necessary to cause the piercing elements to extend and retract. This feature is taught by the admitted prior art figure 7. The only element which is being incorporated from the art of Wisner is the teaching that it is well known to provide piercing needles which are mounted on a rotatable wheel and are independently rotatably with respect to the axis of rotation in order to allow the pins to enter and leave the workpiece in a vertical fashion to create "accurate reproductions of the shape of the perforating elements" (column 2 lines 15-18). All the other elements of the claim that aren't drawn towards the system of providing the additional axis of rotation are taught by APA.

9. Applicant argues that the art of Wisner discloses groups of perforating elements and therefor fails to disclose that "each perforating element is movable toward and away

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from other perforating elements." Again, examiner notes that the only element which is being incorporated from the art of Wisner is the teaching that it is well known to provide piercing needles which are mounted on a rotatable wheel and are independently rotatably with respect to the axis of rotation in order to allow the pins to enter and leave the workpiece in a vertical fashion to create "accurate reproductions of the shape of the perforating elements" (column 2 lines 15-18). All the other elements of the claim that aren't drawn towards the system of providing the additional axis of rotation are taught by APA. APA clearly discloses singular piercing elements that are spaced about the circumference of the cylinder. In the combination in view of Wisner, these individual piercing elements are now allowed an additional axis of rotation to avoid creating slashed trenches. The plurality of needles as taught by Wisner is not applied to the art of APA, just the teaching of providing the additional axis of rotational freedom.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JOSEPH DEFRANK whose telephone number is (571)270-3512. The examiner can normally be reached on Monday - Thursday; 9am-6pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Boyer Ashley can be reached on (571) 272-4502. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Jason Daniel Prone/  
Primary Examiner, Art Unit 3724

Joseph De Frank  
Examiner  
Art Unit 3724

JD  
5/25/09  
/J. D./  
Examiner, Art Unit 3724